REMARKS

Applicant respectfully requests reconsideration of the present U.S. Patent application. Claims 1-24 are pending. Claims 1-24 have been amended.

Claims 1-20, and 22-24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,181,699 B1 issued to Crinion, et al. (hereinafter Crinion) in view of Biedron, "Metropolitan Area Network Services Comprised of Virtual Local Area Networks Running Over Hybrid-Fiber/Coax and Asynchronous Transfer Mode Technologies," in *Proceedings of the International Society of Optical Engineering*, Vol. 2609, Paper No. 2609-06 (hereinafter Biedron). Claim 21 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Crinion in view of Biedron and further in view of U.S. Patent No. 5,802,047 issued to Kinoshita. For at least the reasons set forth below, Applicant submits that claims 1-24 are not rendered obvious by Crinion, Biedron, and Kinoshita.

Claim 1 recites a system comprising:

> a metropolitan area network (MAN);
> a first VLAN and a second VLAN, wherein the second VLAN comprises the first VLAN; and
> a switch coupled to the MAN and the first and second VLANs to receive from the first VLAN a data packet having a first VLAN ID associated with the first VLAN, to replace the first VLAN ID for a second VLAN ID associated with the second VLAN, wherein the second VLAN ID is different from the first VLAN ID, and to forward the modified data packet from the first VLAN to the MAN.

Claims 12, 18, and 20 similarly recite replacing a first VLAN ID associated with a first VLAN with a second VLAN ID associated with a second VLAN, wherein the first VLAN ID is different from the second VLAN ID.

Crinion discloses an apparatus and method for assigning VLAN tags based on data frame information and the port on which the data frame is received. (See col. 1, lines 45-47.)

The Office Action states that Crinion (at col. 4, lines 14-18) discloses a tag that includes a VLAN ID, and that Crinion (at col. 3 line 33) discloses tag replacement. The passage cited in the Office Action for tag replacement recites the following:

> If a frame lacks a tag, or if tag replacement is desired, search circuit 130 searches the lookup data in content addressable memory 110 for the frame information. Once it has located the frame information, each circuit 130 reads the associated tag data.

(See Crinion, col. 3, lines 32-37). This passage merely indicates that if a frame is missing a tag or the tag needs to be replaced, the circuit will look up the tag data from the memory and insert that tag data into the frame. Therefore, the missing or "replaced" tag only includes a VLAN ID corresponding to the VLAN from which the data packet originated. Crinion does not teach replacing a first VLAN ID associated with a first VLAN with a second VLAN ID associated with a second VLAN, wherein the first VLAN ID is different from the second VLAN ID.

Biedron teaches a hybrid fiber-coax system. The Office Action states that Biedron teaches a Metropolitan Area Network (MAN) including a router and a switch. Whether or not Biedron teaches such a system, Biedron does not disclose, teach, or suggest replacing a first VLAN ID associated with a first VLAN with a second VLAN ID associated with a second VLAN, wherein the first VLAN ID is different from the second VLAN ID, and therefore does not cure the deficiencies pointed out above with respect to Crinion.

Kinoshita teaches an inter-LAN connecting device with a combination of routing and switching functions. The Office Action states that Kinoshita teaches assigning a VLAN ID based a data packet's IP address. Whether or not Kinoshita teaches this feature, Kinoshita does not disclose, teach, or suggest replacing a first VLAN ID associated with a first VLAN with a second VLAN ID associated with a second VLAN, wherein the first VLAN ID is

different from the second VLAN ID, and therefore fails to cure the deficiencies pointed out above with respect to Crinion and Biedron.

Neither Crinion nor Biedron nor Kinoshita discloses, teaches, or suggests replacing a first VLAN ID associated with a first VLAN with a second VLAN ID associated with a second VLAN, wherein the first VLAN ID is different from the second VLAN ID. This feature is recited in independent claims 1, 12, 18, and 20. Therefore, whether taken individually or in combination, claims 1, 12, 18, and 20 are patentable over Crinion, Biedron, and Kinoshita.

Claims 2-11, 13-17, 19, and 21-24 are dependent claims and distinguish for at least the same reasons as their independent base claims in addition to adding further limitations of their own. Therefore, Applicant submits that claims 2-11, 13-17, 19, and 21-24 are patentable over the teachings of Crinion, Biedron, and Kinoshita for at least the reasons set forth above.

CONCLUSION

In view of the amendments and remarks above, Applicant submits that claims 1-24 are in condition for allowance and such action is respectfully solicited. The Examiner is respectfully requested to contact the undersigned by telephone if such contact would further the examination of the present application.

Please charge any shortages and credit any overcharges to our Deposit Account number 02-2666.

Respectfully submitted,
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Marked-Up Claim Amendments

Please amend claims 1-24 as follows.

1. (Twice Amended) [An aggregated virtual local area network (VLAN) architecture] A system comprising:

a metropolitan area network (MAN) [having at least one of a router and a switch];

a first virtual local area network (VLAN) and a second VLAN, wherein the second VLAN comprises the first VLAN; and

[an edge] a switch [connecting] coupled to the MAN [to] and the first and second VLANs [a super-VLAN, the super-VLAN comprising at least one of a plurality of sub-VLANs, and wherein the edge switch applies a modified bridge forwarding rule to exchange a] to receive from the first VLAN a data packet having a first VLAN ID associated with the [sub-VLAN for a] first VLAN, to replace the first VLAN ID with a second VLAN ID associated with the [super-VLAN before forwarding a] the second VLAN, wherein the second VLAN ID is different from the first VLAN ID, and to forward the modified data packet from the [sub-VLAN over] first VLAN to the MAN [using the at least one of a router and a switch].

2. (Amended) The [aggregated VLAN architecture] system of claim 1, wherein the second VLAN further comprises a third VLAN, and wherein the [edge] switch further [applies a modified bridge media access control (MAC) address learning rule] to prevent the modified data packet from the first VLAN [sub-VLAN] from being forwarded to the third VLAN [a different sub-VLAN, the MAC address learning rule comprising a MAC address entry in a forwarding data base (FDB) for each of the plurality of sub-VLANs and the super-VLAN].

3. (Amended) The [aggregated VLAN architecture] system of claim 2, wherein the switch to further maintain a forwarding data base (FDB) for the first, second, and third VLANs,

wherein each FDB contains one or more media access control (MAC) address entries [the MAC address entry is added to the FDB for the sub-VLAN and the super-VLAN when a new MAC address is learned from the sub-VLAN].

4. (Amended) The [aggregated VLAN architecture] system of claim 3, wherein the switch to maintain a FDB for the first, second, and third VLANs comprises the switch to add a new [the] MAC address entry [is added] to the FDB for each of the first, second, and third VLANs [plurality of sub-VLANs and the super-VLAN] when [the] a new MAC address is learned from the first, second, or third VLAN [super-VLAN].

5. (Amended) The [aggregated VLAN architecture] system of claim 1, wherein the [edge] switch [applies the modified bridge forwarding rule to exchange a] further to receive from the MAN a second data packet having the second VLAN ID, to replace the second VLAN ID [associated with the super-VLAN for a] with the first VLAN ID [associated with the sub-VLAN before forwarding a] and to forward the modified second data packet from the MAN to the first VLAN [super-VLAN to a customer associated with the sub-VLAN].

6. (Amended) The [aggregated VLAN architecture] system of claim 1, wherein the first VLAN ID [associated with the sub-VLAN] is obtained from a header encapsulating the data packet.

7. (Amended) The [aggregated VLAN architecture] system of claim 6, wherein the header encapsulating the data packet is an Institute of Electrical and Electronics Engineers (IEEE) 802.1Q frame tag.

8. (Amended) The [aggregated VLAN architecture] system of claim 1 [5], wherein the second VLAN ID [associated with the super-VLAN] is obtained from [the] a header encapsulating the data packet.

9. (Amended) The [aggregated VLAN architecture] system of claim 8, wherein the header encapsulating the data packet is an Institute of Electrical and Electronics Engineers (IEEE) 802.1Q frame tag.

10. (Amended) The [aggregated VLAN architecture] system of claim 1, wherein the first VLAN ID [associated with the sub-VLAN] is obtained from an internal value stored in the [edge] switch.

11. (Amended) The [aggregated VLAN architecture] system of claim 1, wherein the second VLAN ID [associated with the super-VLAN] is obtained from an [a second] internal value stored in the [edge] switch.

12. (Amended) A method [of aggregating multiple VLANs in a metropolitan area network] comprising:

[classifying a data packet originating from a sub-VLAN in accordance with an aggregated VLAN configuration, the aggregated VLAN configuration associating the sub-VLAN with a sub-VLAN ID and a super-VLAN ID;

exchanging the sub-VLAN ID for the super-VLAN ID before forwarding the data packet to a MAN;

classifying a data packet originating from a super-VLAN in accordance with the aggregated VLAN configuration, the aggregated VLAN configuration further associating the super-VLAN with a super-VLAN ID and at least one of a plurality of sub-VLAN IDs;

exchanging the super-VLAN ID for the at least one sub-VLAN ID before forwarding the data packet to a customer associated with the at least one sub-VLAN ID]

receiving at a switch coupled to a metropolitan area network (MAN), a first virtual local area network (VLAN), and a second VLAN, a data packet from the first VLAN, the data packet having a first VLAN ID associated with the first VLAN;

replacing the first VLAN ID with a second VLAN ID associated with the second VLAN, wherein the first VLAN ID is different from the second VLAN ID; and

forwarding the modified data packet from the first VLAN to the MAN.

13. (Amended) The method of claim 12, further comprising receiving at the switch from the MAN a second data packet having the second VLAN ID, replacing the second VLAN ID with the first VLAN ID, and forwarding the modified second data packet from the MAN to the first VLAN [wherein the classification comprises obtaining the sub-VLAN ID and the super-VLAN ID from a tag in the data packet, and verifying the obtained VLAN IDs in accordance with the aggregated VLAN configuration values stored in the switch that performs the classification].

14. (Amended) The method of claim 12 [13], further comprising obtaining the first and second VLAN IDs from the data packet [wherein the tag is an 802.1Q frame tag].

15. (Amended) The method of claim 12, further comprising obtaining the first and second VLAN IDs from internal values stored in the switch [wherein the classification comprises obtaining the sub-VLAN ID and the super-VLAN ID from the aggregated VLAN configuration values stored in the switch that performs the classification].

16. (Amended) The method of claim 12, further comprising[:] preventing the data packet originating from the first VLAN [sub-VLAN] from being forwarded to a third VLAN [different sub-VLAN using a modified MAC address learning rule].

17. (Twice Amended) The method of claim 16, further comprising maintaining a forwarding data base (FDB) for the first, second, and third VLANs, wherein each FDB contains one or more media access control (MAC) address entries, and adding a new MAC address entry to the FDB for each of the first, second, and third VLANs when a new MAC address is learned from the first, second, or third VLAN [wherein the modified MAC address learning rule comprises a MAC address entry in a table stored in the switch performing the classification, wherein the MAC address entry is added for each of the sub-VLAN and the super-VLAN when the MAC address is learned from the sub-VLAN, and wherein the MAC address entry is added for all of the plurality of sub-VLANs in the aggregated VLAN configuration and the super-VLAN when the MAC address is learned from the super-VLAN].

18. (Twice Amended) An article of manufacture comprising:

a machine accessible medium including content that when accessed by a machine causes the machine to

[an electronically accessible medium providing instructions for aggregating multiple VLANs in a metropolitan area network that, when executed by one or more processors, cause the one or more processors to

classify a data packet originating from a sub-VLAN in accordance with an aggregated VLAN configuration, the aggregated VLAN configuration associating the sub-VLAN with a sub-VLAN ID and a super-VLAN ID;

classify a data packet originating from a super-VLAN in accordance with the aggregated VLAN configuration, the aggregated VLAN configuration further associating the super-VLAN with a super-VLAN ID and at least one of a plurality of sub-VLAN IDs; and

exchanging the sub-VLAN ID for the super-VLAN ID before forwarding the data packet to a MAN and exchanging the super-VLAN ID for the at least one sub-VLAN ID before forwarding the data packet to a customer associated with the at least one sub-VLAN ID]

receive at a switch coupled to a metropolitan area network (MAN), a first virtual local area network (VLAN), and a second VLAN, a data packet from the first VLAN, the data packet having a first VLAN ID associated with the first VLAN;

replace the first VLAN ID for a second VLAN ID associated with the second VLAN, wherein the first VLAN ID is different from the second VLAN ID; and

forward the modified data packet from the first VLAN to the MAN.

19. (Amended) The article of manufacture of claim 18, further comprising a machine accessible medium including content that when accessed by a machine causes the machine to receive at the switch from the MAN a second data packet having the second VLAN ID, replace the second VLAN ID for the first VLAN ID, and forward the modified second data packet from MAN to the first VLAN [A method for controlling processing of data packets in a switch connected to a metropolitan area network (MAN), comprising:

propagating a data packet originating from one of a plurality of sub-VLANs, the plurality of sub-VLANs belonging to a super-VLAN;

exchanging a VLAN ID identifying the originating sub-VLAN with a super-VLAN ID identifying the super-VLAN to which the originating sub-VLAN belongs;

controlling the processing of the data packet to the MAN in accordance with the exchanged super-VLAN ID and a destination Media Access Control (MAC) address specified in the data packet].

20. (Amended) [An edge] A switch [for controlling processing of data packets in a metropolitan area network MAN,] comprising:

a port for receiving a data packet [on an edge switch originating] from a first VLAN [one of a plurality of VLANs, the plurality of VLANs associated with a super-VLAN];

[a means for assigning] an assigner to assign a first VLAN ID to the data packet that identifies the [originating] first VLAN;

a verifier [means for verifying] to verify that the assigned first VLAN ID matches a value stored in a memory of the [edge] switch;

a controller [for controlling] to control the processing of the verified data packet and to [exchange] replace the verified first VLAN ID [for] with a second VLAN ID that identifies a second VLAN [super-VLAN ID that identifies the associated super-VLAN]; and

a [means for propagating] forwarder to forward the [processed] modified data packet to the MAN.

21. (Amended) The [edge] switch of claim 20, wherein the assigner further identifies the second VLAN [means for assigning the VLAN ID includes deriving the identity of the super-VLAN associated with the originating VLAN] based on the contents of the data packet's source Internet Protocol (IP) address.

22. (Amended) The [edge] switch of claim 20, wherein the [means for assigning the VLAN ID includes obtaining the] assigner to assign the first VLAN ID comprises the assigner to obtain the first VLAN ID from a header encapsulating the data packet.

23. (Amended) The [edge] switch of claim 20, further comprising a preventer to prevent the data packet from being forwarded to a third VLAN [wherein the value in the memory of the edge switch is comprised of an aggregated VLAN configuration].

24. (Amended) The [edge] switch of claim 20, further comprising:

a second port for receiving [the] a second data packet from the second VLAN, and wherein the assigner to assign the second VLAN ID [super-VLAN; a means for assigning a super-VLAN ID] to the second data packet that identifies the second VLAN, the verifier to verify that the assigned second VLAN ID [originating super-VLAN; a means for verifying that the assigned super-VLAN ID] matches a second value in [a] the memory of the [edge] switch[;], the controlling to replace the verified second VLAN ID [the means for controlling the processing of the verified data packet further including a means to exchange the verified super-VLAN ID for a] with the first VLAN ID that identifies the [destination] first VLAN[;], and the forwarder to forward the modified second data packet to the first VLAN

[the means for propagating the processed data packet further including a means for propagating the data packet to a customer associated with the destination VLAN].